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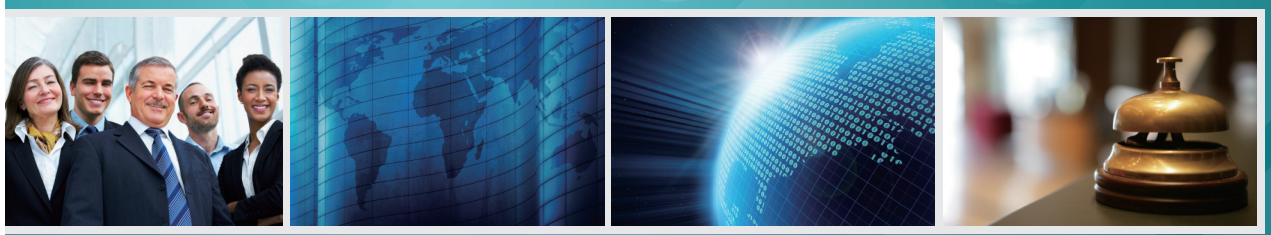
Network Application Platforms

Hardware platforms for next generation networking infrastructure



MR-330A

User's Manual

Publication date:2010-12-21

About

Overview

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	http://www.lannerinc.com
Product Resources	http://assist.lannerinc.com
RMA	http://eRMA.lannerinc.com

Copyright and Trademarks

Acknowledgement

Compliances

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Chapter 1: Introduction

Based on a new generation high-performance OCTEON network processors (Models have CN5020 series dual core MIPS processor), the MR-330A offers up to 2 cnMIPS64 cores on a single chip. The chipset supports a variety of I/O interfaces including Gigabit Ethernet, USB and Mini-PCI interfaces. The built-in encryption, TCP acceleration, and QoS engine provide reliable security functions at top speed. Owing to its highly-integrated hardware support of queuing, scheduling and low latency for real-time traffic, the device is even a perfect platform for high quality voice, video and data services .

The Quick Start Guide will takes you through the basic steps necessary to install your MR-330A System.

Please refer to the chart below for a summary of the system's specifications.

System Specification

Features	Descriptions	
Form Factor		1U Rackmount
Platform	Processor	OCTEON CN5020
	Max Speed	700MHz
	Processor Cores	2
	Instructions per Second (Max)	2.8B
	Encryption Engine	Yes
	Networking Engine	Yes
	QoS Engine	Yes
	TCP Acceleration	Yes
System Memory	Technology	DDR2 400MHz
	Capacity	1GB
Storage	Storage Interface	CompactFlash (type II) x 1
		Serial-ATA
	NOR Boot Flash	8 MB
Networking	No. of ports (Max)	Combo ports (RJ45x2, SFPx2) 4 GbE switch
	Controller	Marvell 88E1111 (RGMII interface), Marvell 88E6161 (RGMII interface)
I/O Interface	Console	DB9 x 1
	USB 2.0	1
Expansion		Mini-PCI x 1
Cooling	Processor	Passive CPU heatsink
Environmental Parameters	Temperature, Ambient Operating	0~40°C
	Temperature, Ambient Storage	-20~70°C
	Humidity (RH), Ambient Operating and Non-Operating	5% ~ 95%, non condensing
	Internal RTC	Yes
Physical Dimensions	Dimensions (WxHxD)	431 x 44 x276.7mm (16.97x1.73x10.89in)
	Weight	3.5Kg
Power	Type / Watts	100W Single AC Power Supply
	Input	100~240V / 60~50Hz /3~1.5A
Approvals & Compliance		CE Emission, FCC Class A, RoHS
Ordering	System	MR-330A: CN5020-700, 1GB

Chapter 1

Introduction

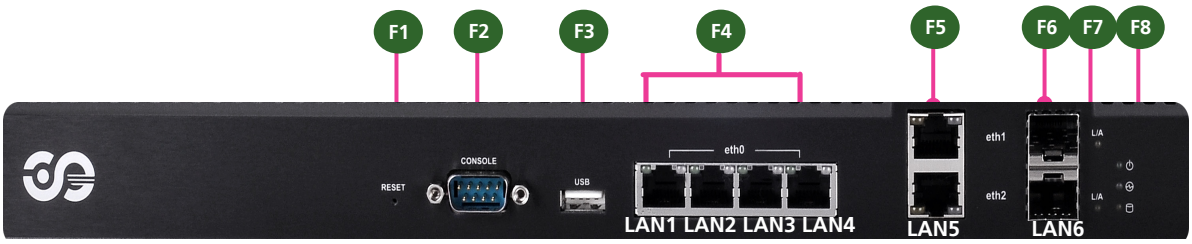
Package Contents

Your package contains the following items:

- MR-330A Network Security Platform
- Power cable
- 1 crossover Ethernet cable (1.8 meters)
- 1 straight-through Ethernet cable (1.8 meters)
- 1 DB-9 to DB-9 female console cable
- Serial-ATA hard drive cable
- 1 threaded screw set
- 1 ear bracket set (Optional)
- SDK Patch file

Chapter 1

Front Panel Features



F1 Reset Switch

It is a reset switch.

F2 RS-232 COM Port

It is a DB-9 Male Connector. Using suitable RS-232 cable, you can connect an appropriate device, for example, a terminal console for diagnostics.

Terminal Configuration Parameters: 115200 baud, 8 data bits, no parity, 1 stop bit , no flow control.

F3 USB 2.0 Ports

It connects to any USB devices, for example, a flash drive. Besides this external USB port, there is another one offered with the onboard pin header connectors (refer to *Jumper Setting* on *Chapter 3 Motherboard Information*)

F4 4 10/100/1000 Gigabit Ethernet Ports

The Ethernet switch of 4 Gigabit ports is provided by the Marvell Linkstreet 88E6161 PHY .

LED Indicator	LED Function	LED Color	On	Off	Blinking
Left	Link/Activity	Green	Linked	No Link	Linking/there is traffic
Right	Data Speed	Green Orange	100 Mbps 1000 Mbps	10 Mbps	

F5 2 Gigabit Ethernet RJ45 Ports

The Gigabit Ethernet ports are provided by 88E1111 Integrated 10/100/1000 Ultra Gigabit Ethernet Transceiver through the RGMII interface. They are capable of auto-negotiation and have triple speed (10BASE-T, 100BASE-TX, and 1000BASE-T) support. Note that only RJ45 or fiber interface of the combo port can work at a time.

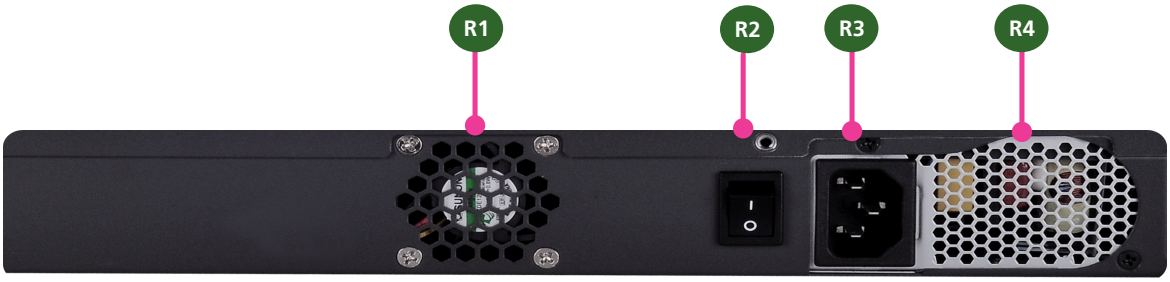
LED Indicator	LED Function	LED Color	On	Off	Blinking
Left	Link/Activity	Green	Linked	No Link	Linking/there is traffic
Right	Data Speed	Green Orange	1000 Mbps 100 Mbps	10 Mbps	

F6 2 Fiber-optic SFP ports

The 1000BASE-X Ethernet connection are provided by 88E1111 Integrated 10/100/1000 Ultra Gigabit Ethernet Transceiver through the RGMII interface. Note that only RJ45 or Fiber interface of the combo port can work at a time. And the ports do *not* support copper connections.

F7 Link/ACT LED (amber): If the LED is on, the port is linked. If it blinks, it indicates there is traffic.

Rear Panel Features



R1 System fan

R2 Reset Switch

It is a hardware reset switch. Use a pointed object to press it 5 seconds then release it to reset the system without turning off the power.

R3 AC Power Socket

The system comes with a 100W single power supply. Plug in the AC power cord to this outlet.

R4 Power Supply Fan

Chapter 2: Hardware Setup

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.

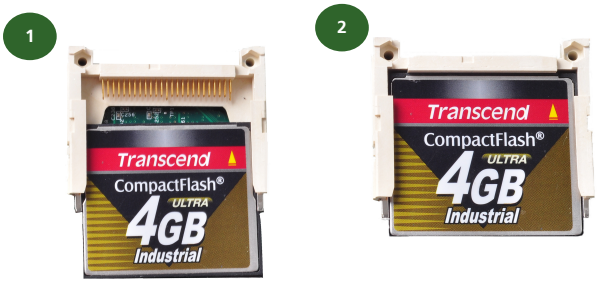
WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button (if there is one) does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Unpower the MR-330A and remove the power cord.
2. Unscrew 2 screws from the two sides and two screws on the back of the top cover of the MR-330A System.
3. Slide the cover backwards and open the cover upwards.

Installing a CompactFlash Card

MR-330A provides one CompactFlash slot slot. Follow the procedures bellow to install a CompactFlash card.

1. Align CompactFlash card and the card slot with the arrow pointing toward the connector.
2. Push the card to insert into the connector.
3. Accessing the CompactFlash card



In the linux environment, you could access the CF card with the following commands:

```
MR330A# mount /dev/cfa1 /mnt/
MR330A# ls /mnt/
```

To put files on the CF Card, use the following procedures:

1. Connect the CF card. It will usually be assigned as the following device:
   /dev/cfa1

2. Mount the CF file system.

```
MR330A#mount /dev/cfa1 /mnt/
```

3. Copy program file(s) to CF.

```
MR330A#cp hello.txt  /mnt/
```

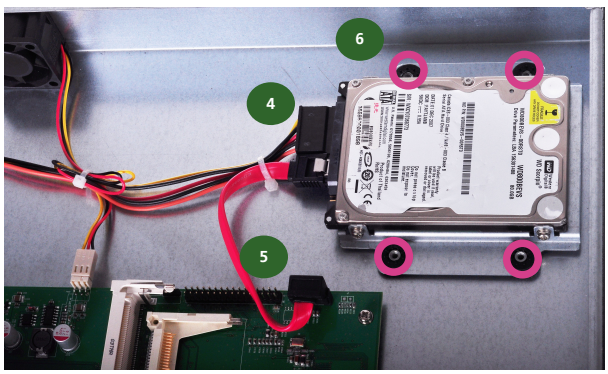
4. Unmount CF file system.

```
MR330A#umount /mnt/
```

Installing the Hard Disk

The system can accommodate one 2.5" Serial-ATA disks. Follow these steps to install a hard disk into the MR-330A:

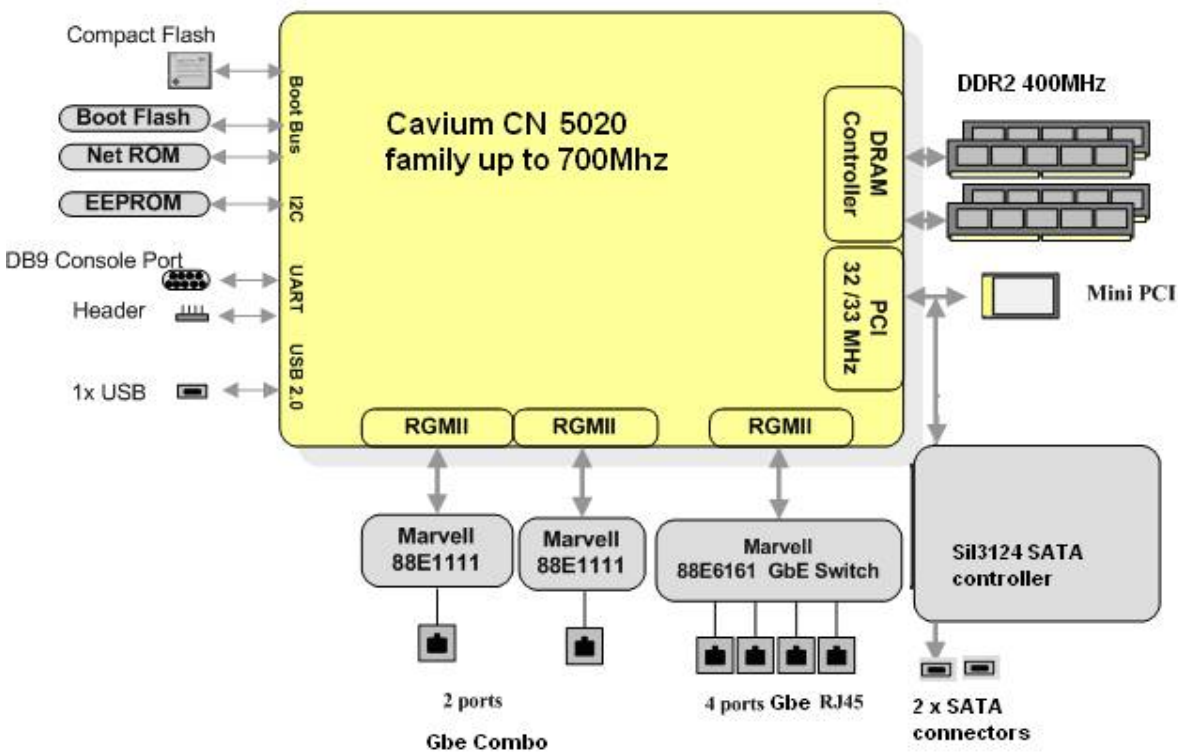
1. Unscrew the 4 screws on the hard disk tray to take out the hard disk tray from the system.
2. Place hard disk on the hard disk tray and align the holes of the hard disk with the mounting holes of the tray.
3. Secure the hard disk with 4 mounting screws on the hard disk tray.
4. Connect the Serial-ATA power (the SATA power cable is attached to the power supply unit) and data cables to the hard disk's power and drive connectors respectively.
5. Plug the Serial-ATA data cable to the Serial-ATA Connector on the main board.
6. Put the hard disk tray with the installed hard disk back and fasten it to the system with the mounting screws.



Chapter 3: Motherboard Information

Block Diagram

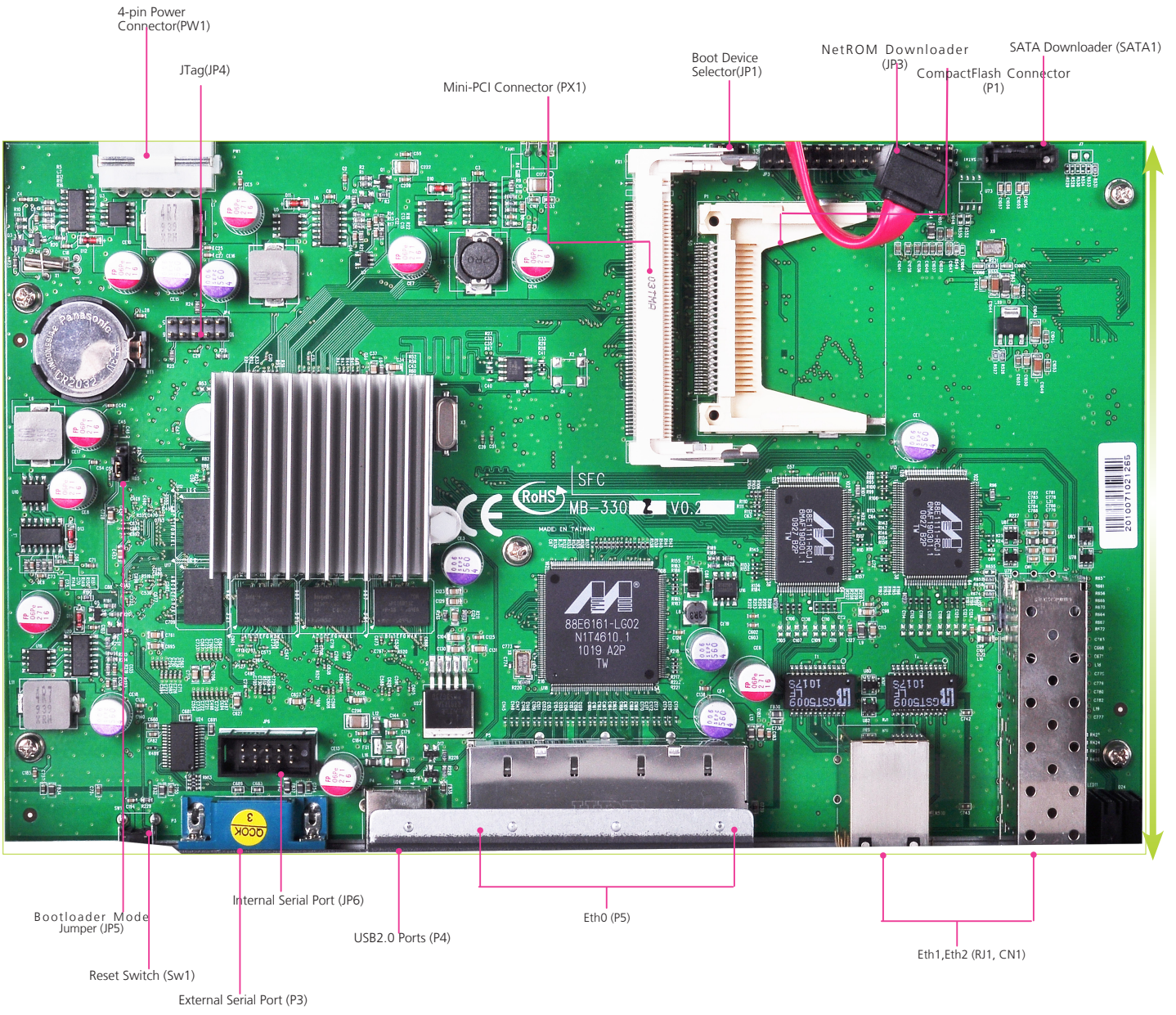
The block diagram depicts the relationships among the interfaces or modules on the motherboard. Please refer to the following figure for your motherboard's layout design.



Chapter 3

Motherboard Layout

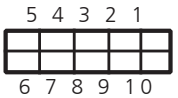
The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



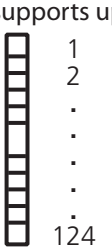
Jumper Settings

JTAG(JP4): The Jtag is a debug port provided as a means of testing the main board and looking for possibility of field faults. It can also be used for flash writing.

PIN NO.	Function	P I N NO.	Function
1	JTAG_TCK	6	E J T A G _ RST#
2	VCC3	7	NC
3	JTAG_TMS	8	NC
4	EJTAG_TRST_L	9	NC
5	JTAG_TDI	10	E J T A G _ TDO

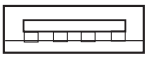


Mini-PCI Connector (PX1): The 124-pin Mini-PCI slot enables a Mini-PCI expansion module to be connected to the board. For example, a Wi-Fi or WiMAX module. The connector supports up to 3W power.



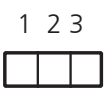
Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	NC	63	VCC3	2	NC	64	FRAME#
3	NC	65	TP	4	NC	66	TRDY#
5	NC	67	SERR#	6	NC	68	STOP#
7	NC	69	GND	8	NC	70	VCC3
9	NC	71	PERR#	10	NC	72	DEVSEL#
11	NC	73	C_BE#1	12	NC	74	GND
13	NC	75	A_D14	14	NC	76	A_D15
15	NC	77	GND	16	NC	78	A_D13
17	PIRQD#	79	A_D12	18	VCC	80	A_D11
19	VCC3	81	A_D10	20	PIRQC#	82	GND
21	NC	83	GND	22	NC	84	A_D9
23	GND	85	A_D8	24	VCC3	86	C_BE#0
25	CK_33M_MINIPCIR	87	A_D7	26	PCI_RST#	88	VCC3
27	GND	89	VCC3	28	VCC3	90	A_D6
29	REQ#1	91	A_D5	30	GNT#1	92	A_D4
31	VCC3	93	NC	32	GND	94	A_D2
33	A_D31	95	A_D3	34	PCI_PME#	96	A_D0
35	A_D29	97	VCC	36	NC	98	NC
37	GND	99	A_D1	38	A_D30	100	NC
39	A_D27	101	GND	40	VCC3	102	GND
41	A_D25	103	NC	42	A_D28	104	M66EN
43	NC	105	NC	44	A_D26	106	NC
45	C_BE#3	107	NC	46	A_D24	108	NC
47	A_D23	109	NC	48	MiniPCIDSEL	110	NC
49	GND	111	NC	50	GND	112	NC
51	A_D21	113	NC	52	A_D22	114	GND
53	A_D19	115	NC	54	A_D20	116	NC
55	GND	117	NC	56	PAR	118	NC
57	A_D17	119	NC	58	A_D18	120	NC
59	C_BE#2	121	NC	60	A_D16	122	NC
61	IRDY#	123	VCC	62	GND	124	VCC3

USB 2.0 Ports (P4): Enabled by the OCTEON's integrated PHY through the I/O bridge, this port is for connecting the USB module cable. The high-speed USB port complies with USB2.0 and support up to 480 Mbps connection speed. It is.



Pin No.	Function
1	5V
2	USB_Port 0_DM
3	USB_Port0_DP
4	GND

Boot Device Selector(JP1): It is a jumper for selecting the flash mode from either normal or ROM mode. The Net mode is for debugging purpose. Adjust this jumper to the ROM mode when NetROM connector (JP3) is being used.

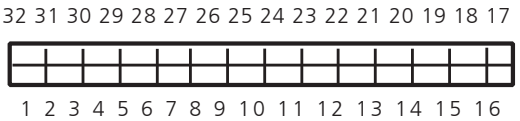


Pin No.	Function
Short 1-2	Normal
Short 2-3	Boot from ROM

Chapter 3

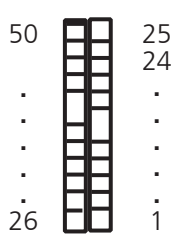
Motherboard Information

NetRom Connector(JP3): The Net ROM device is the tool for simulating the boot image during project developing stage. The NetROM eliminates the need to burn EPROMs or flash to debug code by utilizing the Ethernet to download the code images



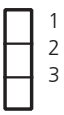
Pin No.	Function	Pin No.	Function
1	NET_A19	2	NET_A16
3	NET_A15	4	NET_A12
5	NET_A7	6	NET_A6
7	NET_A5	8	NET_A4
9	NET_A3	10	NET_A2
11	NET_A1	12	NET_A0
13	NET_D0	14	NET_D1
15	NET_D2	16	GND
17	NET_D3	18	NET_D4
19	NET_D5	20	NET_D6
21	NET_D7	22	NET_CE#
23	NET_A10	24	BOOT_OE#
25	NET_A11	26	NET_A9
27	NET_A8	28	NET_A13
29	NET_A14	30	NET_A17
31	NET_A18	32	5V

CompactFlash Connector (P1): It is for connecting a Compact Flash card to be served as your system's storage. The connector is a CF Type II slot which could fit both CF Type I or CF Type II cards.



Pin No.	Function	Pin No.	Function
1	Ground	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	CS1#	8	N.C.
9	Ground	10	N.C.
11	N.C.	12	N.C.
13	+5V	14	N.C.
15	N.C.	16	N.C.
17	N.C.	18	Addr 2
19	Addr 1	20	Addr 0
21	Data 0	22	Data 1
23	Data 2	24	N.C.
25	N.C.	26	N.C.
27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	CS3#
33	N.C.	34	IOR#
35	IOW#	36	+5V
37	IRQ 15	38	+5V
39	N.C.	40	N.C.
41	Reset#	42	IOCHRDY
43	DMA REQ#	44	DMA ACK#
45	CF Active	46	PDIAG#
47	Data 8	48	Data 9
49	Data 10	50	Ground

Bootloader Mode Jumper (JP5): There are two bootloader modes on the MR-330 board; namely, failsafe and normal bootloader mode. Use this jumper to switch between them.

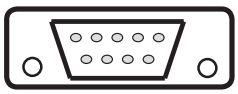


Pin No.	Function
Short 1-2	Failsafe
Short 2-3	Normal

External Serial Port(P3): It is the RS-232 serial port and assigned as COM0.

Pin No.	Pin name
1	N.C.
2	SIN0
3	SOUT0
4	N.C.
5	GROUND

1 2 3 4 5

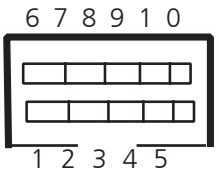


6 7 8 9

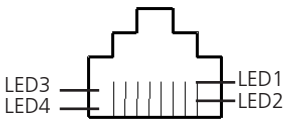
Pin No.	Pin name
6	N.C.
7	N.C
8	N.C.
9	N.C.

Serial Interface Connectors(JP6): It is for connecting the RS-232 serial port module cable. And the port is assigned as COM1.

PIN NO.	Function	PIN NO.	Function
1	VCC3	6	N.C.
2	RXD1	7	N.C.
N	TXD1	8	N.C.
4	NC	9	N.C.
5	GND	10	N.C



Ethernet Switch Ethernet 0 (P5): The Ethernet switch of 4 Gigabit ports is provided by the Marvell Linkstreet 88E6161 PHY through RGMII.

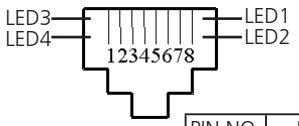


PIN NO.	Function	PIN NO.	Function
1	P0_MDIP0	6	1.8V_GE_PORT
2	P0_MDIN0	7	P0_MDIP2
3	P0_MDIP1	8	P0_MDIN2
4	P0_MDIN1	9	P0_MDIP3
5	1.8V_GE_PORT	10	P0_MDIN3
LED1	Port1_100M_GREEN-2	LED2	Port_1000M_AMBER-2
LED3	Port_Link/ACT-2	LED4	VCC3

Ethernet 1 and Ethernet 2 Port : These two Gbe RJ45 and SFP combo Small Form-factor Pluggable (SFP) ports are provided by the Marvell 88E1111 GbE PHY It has the following capability highlights:

- Compliant with the IEEE 802.3 10Base-T/100Base-Tx/ 1000Base-T
- Auto-adjusting between 10M/100M/1000M connection speed
- Auto-negotiation between MDI and MDIX crossover at all speeds of operation
- Energy Detect and Energy Detect+ low power modes
- Three loopback modes for diagnostics
- Software programmable LED modes including LED testing

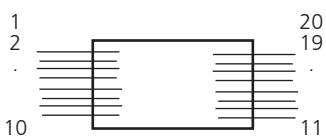
Ethernet 0/1Copper Connector (RJ1)



PIN NO.	Function	PIN NO.	Function
1	P1_MDXP0	6	P1_MDXN1
2	P1_MDXN0	7	P1_MDXP3
3	P1_MDXP1	8	P1_MDXN3
4	P1_MDXP2	9	
5	P1_MDXN2	10	
LED1	Port1_100M_GREEN-2	LED2	Port_1000M_AMBER-2
LED3	Port1_Link/Act-2	LED4	VCC3

Ethernet 0/1Fiber Connector(CN1)

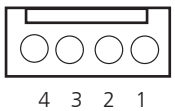
PIN NO.	Function	PIN NO.	Function
T1	GND	T11	GND
T2	VCC3	T12	S_IN-
T3	GND	T13	S_IN+
T4	NC	T14	GND
T5	NC	T15	SFP11_VCCR
T6	VCC3	T16	SFP11_VCCT
T7	NC	T17	GND
T8	SFPA_LOS10	T18	S_OUT+
T9	GND	T19	S_OUT-
T10	GND	T20	GND



Reset Switch (SW1): The reset switch can be used to restart the system without turning off the power.

Pin No.	Function
1	GND
2	Factory_Reset

4-Pin Power Connector (PW1): Connect the cables from the power supply unit to this connector.



Pin No.	Function
1	VCC (12V)
2	Ground
3	Ground
4	VCC (5V)

Appendix A: Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:

Improper or inadequate maintenance by the customer Unauthorized modification, misuse, or reversed engineering of the product Operation outside of the environmental specifications for the product.

RMA Service

Requesting a RMA#

6. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
7. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
8. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
9. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

Appendix A

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: □ Repair(Please include failure details) □ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____	
Shipping by: □ Air Freight □ Sea □ Express_____ □ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date